



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Robert R. Scott, Commissioner

WATER CONSERVATION PLAN APPROVAL

May 8, 2018

Stephen Brewer
Town of Raymond
Public Works Department
4 Epping Street
Raymond, NH 03077
sbrewer@raymondnh.gov

Transmitted via Email

**Subject: Raymond – Raymond Water Department (PWS ID #: 1971010)
Water Conservation Plan, NHDES # 150002**

Dear Mr. Brewer:

On April 25, 2018, the New Hampshire Department of Environmental Services (“DES”) Drinking Water and Groundwater Bureau received a Water Conservation Plan (the “WCP”), signed on April 25, 2018, for Raymond Water Department located in Raymond, New Hampshire. Pursuant to RSA 485:61 and Env-Wq 2101, community water systems seeking permits from DES for new sources of groundwater shall submit a water conservation plan to DES. Based on review of the WCP, DES has determined the WCP complies with Env-Wq 2101, *Water Conservation* rules.

Pursuant to Env-Wq 2101, the Town of Raymond and the Rockingham Planning Commission were provided a copy of the WCP, along with other required materials.

DES approves the WCP based on the following conditions:

1. No later than source activation, all source meters, distribution meters, meters measuring water consuming processes, and any transfer meters and data loggers shall be installed.
2. Upon source activation, source meters and any other meters measuring water consuming processes prior to distribution shall continue to be read at least monthly (no sooner than 27 days and no later than 33 days from the last meter reading).
3. The system shall continue to report monthly water use for sources and destinations to the DES Water Use Registration and Reporting Program on a quarterly basis.
4. Meters shall continue to be installed on all service connections and points of transfer to consecutive water systems and privately owned redistribution systems that are added to the system.
5. Service meters shall continue to be read at least quarterly (no sooner than 83 days and no later than 97 days from the last meter reading).

6. Within 2 years of source approval, a conservation rate structure shall be implemented for residential connections and residents shall be billed at least quarterly.
 - a. Residents shall be charged based on the amount of water each residential connection uses, and the rate shall be structured so that the cost per gallon(s) is either constant or increasing with the amount of water used.
7. Upon source approval, a water balance (the difference between the system input volume and the metered authorized consumption) shall be reported annually to DES. The water balance shall be reported by March 1 for the prior year using the online reporting tool.
8. All meters shall be installed per the manufacturer's instructions or American Water Works Association standards.
9. Upon source activation, all meters shall be tested and maintained based on the schedule proposed in the WCP.
10. Within one year of source approval, a leak detection and repair program shall be implemented in accordance with the WCP.
11. Leaks shall be repaired within 60 days of discovery.
12. From the date of this approval, all new non-metallic pipes installed in the system shall be outfitted with detectable tracer tape or detectable tracer wire, or be GPS located and maintained in a GIS system.
13. No later than source activation, a water conservation outreach and education program shall be implemented in accordance with the WCP.
14. Within 5 business days of source approval, any consecutive water systems or privately owned redistribution systems receiving water from this system shall be sent a letter through certified mail with return receipts requested and informed of the proposed source activation date as well as a statement indicating that upon source activation, they will be required to comply with Env-Wq 2101.
15. Within 60 days of obtaining source approval, the system shall send copies of the certified mail return receipts requested in #14., above, to DES.
16. Every three years from the date of this approval, a *Water Conservation Plan Ongoing Compliance Reporting Form* shall be submitted to DES documenting how the system has maintained compliance with the WCP. The following records shall be maintained by the water system to include with the report:
 - a. A leak log including the date a leak was discovered, the date a leak was repaired, the type of leak (ex. water main, service line, hydrant, valve), the approximate size of the leak (gpm), and the nearest address to the leak.
 - b. Verification that the system became a WaterSense partner and examples of WaterSense Program promotion.

- c. Date of installation and replacement of all meters as well as testing and calibration records.
- d. Leak detection survey reports.

17. Proposed changes to the WCP shall not be implemented unless approved by DES.

The online *Annual Water Balance Reporting Form* and the *Water Conservation Plan Ongoing Compliance Reporting Form* may be located by going to the DES website (www.des.nh.gov), clicking on the “A-Z List” in the top right corner of the page, clicking “Water Conservation,” and scrolling down to “Forms/Applications.”

Please feel free to contact me with any questions at (603) 271-0659 or via e-mail at kelsey.vaughn@des.nh.gov.

Sincerely,



Kelsey Vaughn
Water Conservation Program
Drinking Water and Groundwater Bureau

cc: Scott Keddy, Denise O’Grady, Craig Wheeler; Town of Raymond
Lynnette Carney; Underwood Engineers, Inc.
Tim Roache; Rockingham Planning Commission
Steve Roy, Rick Skarinka, Stacey Herbold; DES

Water Conservation Plan



APRIL 2018

Town of Raymond
Department of Public Works
Water Division

4 Epping Street
Raymond, New Hampshire 03077
603.895.7049

Public Water System Number 1971010

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WATER CONSERVATION PLAN

RAYMOND WATER DEPARTMENT

A community water system seeking authorization for a new source of water must submit a water conservation plan to the New Hampshire Department of Environmental Services (NHDES) for approval demonstrating how the water system proposes to comply with water conservation standards pursuant to Env-Wq 2101, *Water Conservation* rules. RAYMOND WATER DEPARTMENT is an existing large community water system.

Activities outlined in the water conservation plan will be completed by water system personnel under the supervision of a certified water system operator.

I. Introduction

A. Contact Information

1. Name and location of system: Raymond Water Department (Raymond, NH)
2. Current owner of system and mailing address:
Steve Brewer, Director of Public Works
Town of Raymond
4 Epping Street
Raymond, NH 03077
3. Name and mailing address of designer of water conservation plan:
Scott Keddy, Water Superintendent
Town of Raymond
4 Epping Street
Raymond, NH 03077
Office: 603.895.7050
Cell: 603.867.9862
email: skeddy@raymondnh.gov

B. System Overview

1. Brief description of the community being served (ex. number of units, apartments, partially attached condos, individual homes, shared common facilities, population, etc.):
The Raymond Water Department serves approximately 25% of the residential units in the Town of Raymond and provides water to many of the commercial properties located along Rt 102 and Rt 107. The system also provides water to one residential development in Fremont, NH (Witham Countryside Homes).
2. Description of water sources, including water sources to be developed for non-potable uses such as irrigation:
Currently, there are three active gravel packed wells all located at the Cider Ferry Well Field: Well #1R, Well #2, and Well #3. Well #4 is a new bedrock well located on the property of

Raymond High School on Harriman Hill Road. The permitting for Well #4 requires the approval of a water conservation plan.

3. Number of current connections for each of the following classes:

- a) Residential: 1,149
- b) Industrial/Commercial/Institutional: 125
- c) Municipal: 10

4. Names of any consecutive water systems or privately owned redistribution systems:

We provide water from the municipal system to Pennichuck Water Company, which in turn redistributes that water to residents of the Green Hills mobile home park (PWS 1973030). In 2016, the annual water provided to Pennichuck was 10,005,070 gallons.

5. Description of any connections that receive more than 20,000 gallons per day (gpd):

We provide water from the municipal system to the Pine Acres Campground on Route 102. This is a seasonal campground facility. In 2016, this business used 2,192,100 gallons of water. At one point in time, this campground included a water park. The water park has since been discontinued.

Witham Countryside Homes is a mobile home park located in neighboring Fremont, NH. In 2016, we supplied approximately 3,928,324 gallons of water to the 57 residential units within this development.

The WalMart Regional Distribution Center is served by the Raymond Water Department. They consume approximately 2,100,000 gallons of water annually.

The residential community known as Green Hills is provided water by Pennichuck Corporation. The Raymond Water Department provides water to Pennichuck Corporation for resale to the residents of Green Hills. The consumption of water at Green Hills is approximately 11,520,000 gallons per year.

C. Transfer of Ownership

- 1. The system ownership is not proposed to be transferred.

II. System Side Management

A. Water Meter

1. Source and Other System Side Meters

- a) No later than the source activation date, meters will be installed on each new and any existing water source.
- b) No later than the source activation date, all water consuming processes prior to distribution, such as backwash, treatment process water, and continuous analyzers will be metered.

c) An irrigation well is not proposed.

d) Meter information for each proposed and existing water source and other system side meters:

Source Name: Well #1R
Meter Make: Krohne magnetic flow meter
Meter Model: IFS1000 Mod/6
Meter Size: 3"
Meter Flow Range: 0-500 gpm
Meter Installation Date: 10-10-2008
Last Meter Test/Calibration Date: 6-19-2017

Source Name: Well #2 (existing)
Meter Make: Krohne magnetic flow meter
Meter Model: IFS1000 Mod/6
Meter Size: 3"
Meter Flow Range: 0-500 gpm
Meter Installation Date: 1-11-2017
Last Meter Test/Calibration Date: 6-19-2017

Source Name: Well #3 (existing)
Meter Make: Krohne magnetic flow meter
Meter Model: IFS1000 Mod/6
Meter Size: 3"
Meter Flow Range: 0-500 gpm
Meter Installation Date: 10-10-2008
Last Meter Test/Calibration Date: 6-19-2017

Source Name: Well #4 (proposed)
Meter Make: Krohne
Meter Model: Enviromag 2000 or equal
Meter Size: 4"

Distribution Meter (existing Totalizer in the Chemical Room at the WTP)
Meter Make: Krohne magnetic flow meter
Meter Model: IFC 090
Meter Size: 6"
Meter Flow Range: 0-1000 gpm
Meter Installation Date: 11-19-2015
Last Meter Test/Calibration Date: 6-19-2017

e) No later than the source activation date, source meters and other system side meters will be read daily through the SCADA.

2. Service Meter Installation, Reading, and Maintenance

a) Service meters are installed on all service connections and all points of transfer to consecutive water systems and privately owned redistribution systems.

(1) The residential customers on the system are serviced by ¾" meters. These ¾" meters are manufactured by Kent (circa 1970), Badger (circa 1980), Neptune (circa 1980), and Sensus SR II (circa mid-1990s to 2014). The current ¾" meter of choice is the Sensus iPERL ¾" magnetic meters (since 2014).

(a) 124 meters were installed between the 1970s and the early 1990s. Approximately 400 brass Sensus SR II meters were installed in the mid-1990s through 2003. Another 450 brass Sensus SR II meters were installed between 2004 and 2014. After 2014, Sensus iPERL meters have been installed.

(2) The commercial customers on the system are served by ¾" and 1" Sensus iPERL, 1½" Sensus and Omni T2, 2" Sensus, 3" Sensus, 4" Omni T2, and 6" Sensus compound meters.

- b) Service meters are read quarterly (at least every 90 days).
- c) Service meters are read by manual read or touch pad read.
- d) It takes 4 days to read all service meters.
- e) Service meters will be maintained in accordance with II.A.3.e), below.

(1) Currently, we have 124 manual read meters that are overdue for replacement. As noted above, the 124 ¾" meters are manufactured by Kent (circa 1970), Badger (circa 1980), and Neptune (circa 1980). Replacement priority is based on meter age and size.

(2) Our annual operating budget and staffing levels afford us the opportunity to replace approximately 50 meters a year (approximately 4% of total meters). The NHDES recommendation is a meter change-out rate of 20% per year for meters near or exceeding their warranty expiration.

3. Meter Selection, Installation, and Maintenance

- a) All meters will be American Water Works Association (AWWA) certified, with the exception of b), below.
- b) AWWA does not have standards for magnetic flow meters. If a magnetic flow meter is proposed, the meter make, model, size and manufacturer specifications will be forwarded to the NHDES Water Conservation program for review. The meter will not be installed until receiving approval for its use from NHDES.

(1) The magnetic flow meters that are currently installed within the system have been acknowledged by NHDES as the system has evolved over the years.

- c) The selected size of the meters will be based on projected flow rates.
- d) Meters will be installed as specified by the manufacturer, including requirements for horizontal or vertical placement, distance of straight run of pipe upstream and downstream of the meter and strainer installation. If the manufacturer does not supply installation specifics,

meters will be installed in accordance with the "Manual of Water Supply Practices M6, Water Meters-Selection, Installation, Testing, and Maintenance" (AWWA, 2012).

e) The following meter testing and calibration schedule or meter change-out schedule will be implemented. If the manufacturer's accuracy warranty extends beyond the schedule below, the meter will be tested or changed-out no later than the warranty expiration date.

Meter Size (inches)	Testing Rate (years)
<1"	10 yrs
1" - 2"	4 yrs
3"	2 yrs
>3"	1 yr

f) A log of the date meters were installed, tested, calibrated, repaired and replaced will be maintained. Calibration certificates will be kept on file.

B. Water Balance and Water Audit

1. The system currently has service meters installed. The previous year's water balance (system input volume – authorized metered consumption) is attached to this WCP and will continue to be reported to NHDES yearly. The water balance for 2016 was approximately 29.478 million gallons or 25%.

a) Water losses are currently greater than 15%.

(1) Our goals to address this issue include the following:

(a) Continue with annual leak detection surveys of the distribution system along with the repair of all leaks discovered.

(b) Continue to actively replace aged and malfunctioning service meters.

(c) Proceed with testing and calibration of all bulk meters in 2017.

(d) Continue to advocate for additional Capital Improvement Program funding for the replacement of aged water lines and to accelerate meter replacements.

2. The yearly water balance will be reported to NHDES using the NHDES online water balance reporting tool, and will be submitted no later than March 1 of each year. The electronic reporting form is located on the Water Conservation homepage of the NHDES website.

3. The water system will prepare and submit a water audit and response plan if more than 15% of the system input volume cannot be accounted for by authorized metered consumption. The response plan will identify how the water system intends to reduce losses to below 15% within two years.

4. Water audits will be calculated in accordance with the "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (AWWA, 2016).

C. Leak Detection and Repair

1. Description of the system's leak detection program to be implemented within one year of source approval:

Since the late 1980's, the Water Division has retained leak detection services every three years. For the last five years, the Raymond Water Division has participated in the NHDES Leak Detection Survey Grant Program. Going forward, we plan to proceed with annual leak detection surveys.
2. Non-metal pipes will either be GPS located and stored in a GIS system or equipped with detectable tracer tape or detectable tracer wire during new installation.
 - a) As part of the Water Division's Asset Management Program, we plan to map all system components, including non-metal pipes, as a layer in the Town's GIS system. Progress on this effort is driven by available funding and available dollars to match grant funds.
3. Leak detection will be conducted in accordance with the "Manual of Water Supply Practices M36, Water Audits and Loss Control Programs" (AWWA, 2016).
4. Leaks will be repaired within 60 days of discovery unless a waiver is obtained in accordance with Env-Wq 2101.23.
5. A log of all leaks will be maintained, including the date the leak was discovered, the date the leak was repaired, the type of leak (ex. service, main, hydrant, valve), the size of the leak (gpm) and the closest street address.

D. Pressure Management

1. The design pressures of the system are from 40 psi to 72 psi.

III. Consumption Side Management

A. Conservation Rate Structure and Billing

1. Within two years of installing all service meters or within five years of source approval, whichever is earlier, a conservation rate structure will be implemented. Customers will be charged based on usage, and the rate per unit of water will be uniform (ex. \$4.00/1000 gallons of water) or increase with usage (ex. \$4.00/0-500 gallons of water, \$4.50/501-1000 gallons of water).
2. The current rate structure that was implemented in 2013 is as follows:
 - Up to 3,000 gals is \$73.00
 - From 3,001-50,000 gals is \$.44/100 gals
 - Over 50,001 gals is \$.60/100 gals

a) Underwood Engineers is currently performing an update to the Water Rate Study. The previous update occurred in 2013.

(1) The 2017 rate update has principally been driven by a focus on the Capital Improvement needs associated with the system infrastructure. Discussions to date have also included a review of the rate structure to induce a greater level of conservation.

3. Irrigation water will not be billed separately.

4. Customers will continue to be billed quarterly.

B. Educational Outreach Initiative

1. No later than the source activation date, the system will become a WaterSense partner and promote the WaterSense program. The system will include the "Look for WaterSense" logo on all bills, other mailings and the system's website. The logo will be accompanied by the WaterSense web address and WaterSense messaging. Information about the WaterSense program, including the logo and messaging, is available on the program's website (<http://www.epa.gov/watersense/>).

a) The following informative billing practices will continue to be used:

(1) Usage will be represented in gallons on water bills; and

(2) A link to the WaterSense website or other water efficiency website will be included on the bill along with tips for saving water.

2. The system will maintain a log indicating how the system has complied with III. B.1., above. The log will include dates the outreach and education actions were taken and what was done.

IV. Reporting and Implementation

A. By no later than March 1 of each year, a water balance for the previous year will be submitted to NHDES using the electronic reporting form located on the Water Conservation homepage of the NHDES website (www.des.nh.gov).

B. The water system will continue to report monthly production volumes, quarterly to the NHDES Water Use Registration and Reporting Program. Monthly means once every calendar month, but no sooner than 27 days after and no later than 33 days after the previous reading.

C. The water system will submit a form supplied by NHDES once every three years from the date of the water conservation plan approval documenting how compliance with the requirements of Env-Wq 2101, *Water Conservation* rules, is being achieved. The system may attach the meter, leak and outreach and education logs to the form or fill out the form manually.

I certify that I have read this Water Conservation Plan, understand the responsibilities of the water system as referenced in the plan, and that all information provided is complete, accurate, and not misleading.

Owner Name (print): STEPHEN BREWER

Owner Signature: [Signature] Date: APRIL 25, 2018

Appendix A

Definitions

Authorized metered consumption: billed metered water plus unbilled metered water.

Community water system (CWS): a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Consecutive water system: a public water system that buys or otherwise receives some or all of its finished water from one or more wholesale systems for at least 60 days per year.

Final source approval: the date of final well siting approval or the date of issuance of the large groundwater withdrawal permit.

Large community water system: a community water system that serves more than 1,000 persons.

Privately owned redistribution system (PORS): A system for the provision of piped water for human consumption which does not meet the definition of a public water system and meets all of the following criteria:

- (1) Obtains all of its water from, but is not owned or operated by, a public water system; (2) serves a population of at least 25 people, 10 household units or 15 service connections, whichever is fewest, for at least 60 days per year; and (3) has exterior pumping facilities, not including facilities used to reduce pressure, or exterior storage facilities which are not part of building plumbing.

Public water system (PWS): a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Small community water system: a community water system that serves 1,000 people or less.

Source activation date: the date the source is placed into use.

System input volume: the volume of water input to the water supply system after treatment, analysis and storage.

Water balance: the difference between the system input volume and authorized metered consumption.

Water conservation: any beneficial reduction in water losses, waste or use.

Wholesale system: a public water system or an industrial, commercial or institutional (ICI) water user that treats source water and then sells or otherwise delivers finished water to a consecutive water system or privately owned distribution system.

Appendix B

Notification Process

Public Notification Instructions

Once a final draft of the water conservation plan is agreed upon by the applicant and NHDES, NHDES will send a signature line to the applicant for addition to the plan along with a summary of the requirements of Env-Wq 2101, *Water Conservation* rules. Within 10 working days of receiving the summary from NHDES, the applicant is required to provide a copy of the water conservation plan via certified mail with return receipt requested to the governing board of the municipality in which a proposed source is located, all municipalities that will receive water from the water system (if any), all wholesale customers (if any) and the regional planning commission serving the location of the proposed source. In most cases, only the municipality and the regional planning commission will require notification. All signed copies of the certified mail return receipts (the green cards) must be forwarded to NHDES along with the final, signed water conservation plan.

Additional Attachments

The applicant must provide the governing boards with a summary of the requirements of Env-Wq 2101, which may be found at http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/index.htm, and request that the governing board amend local site planning requirements to reflect the requirements of Env-Wq 2101 or to promote water efficiency.

Notification of Consecutive Water Systems and Privately Owned Redistribution Systems

Within 5 working days of obtaining final approval of the source from NHDES, the system is required to notify any consecutive water system or privately owned redistribution system receiving water from the system, that pursuant to Env-Wq 2101.13, the systems must implement a water conservation plan and should contact the NHDES Water Conservation Program using the contact information below.

Kelsey Vaughn, Water Conservationist
New Hampshire Department of Environmental Services
Drinking Water and Groundwater Bureau
PO Box 95
Concord, NH 03302-0095
kelsey.vaughn@des.nh.gov
Phone: (603) 271-0659
Fax: (603) 271-0656



AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
Copyright © 2014, All Rights Reserved.Water Audit Report for: **Town of Raymond (Town of Raymond)**Reporting Year: **2016**

1/2016 - 12/2016

Data Validity Score: **62**

Own Sources (Adjusted for known errors) <i>116.618</i>	System Input <i>116.618</i>	Water Exported <i>0.000</i>	Billed Water Exported				Revenue Water <i>0.000</i>	
		Water Supplied <i>116.618</i>	Authorized Consumption <i>88.598</i>	Billed Authorized Consumption <i>85.400</i>	Billed Metered Consumption (water exported is removed) <i>85.400</i>	Billed Unmetered Consumption <i>0.000</i>	Revenue Water <i>85.400</i>	
				Unbilled Authorized Consumption <i>3.198</i>	Unbilled Metered Consumption <i>1.740</i>	Unbilled Unmetered Consumption <i>1.458</i>		Non-Revenue Water (NRW) <i>31.218</i>
			Water Losses <i>28.020</i>	Apparent Losses <i>7.064</i>	Unauthorized Consumption <i>0.292</i>			
					Customer Metering Inaccuracies <i>6.559</i>			
					Systematic Data Handling Errors <i>0.214</i>			
				Real Losses <i>20.956</i>	Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>			
		Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>						
Leakage on Service Connections <i>Not broken down</i>								
Water Imported <i>0.000</i>								